

Awards

LLNL's long-standing reputation for excellence has been earned in part through the efforts of its scientists, researchers, engineers, and supporting staff. In 1994, many of the Laboratory's people were honored with awards and fellowships to professional societies.



Edward Teller
*Middle Cross with the
Star of the Order of Merit*

Middle Cross with the Star of the Order of Merit

Dr. Edward Teller, one of Hungary's most famous native sons, has been awarded the Middle Cross with the Star of the Order of Merit. The republic's highest civilian decoration has been awarded only a handful of times in the past. Teller, who was born in Budapest in 1908, was recommended for the decoration by Hungarian President Arpad Goncz for Teller's role in ending the Cold War, thereby helping to free Hungary, and in his continuing contributions to the nation.

Pal Tar, Ambassador to the U.S., presented the medal, noting that Teller had been declared *persona non grata* in Hungary for many years, but "as soon as Hungary opened up and started on the road to democracy, Professor Teller never hesitated to go back to his homeland and to think about the problem of his fellow Hungarians . . . full of ideas and projects which I am sure will contribute greatly to the well being of Hungarians and Hungary." Tar also quoted Eugene Wigner, the Nobel prize winner and Teller colleague who also knew Einstein: "Teller is the most original thinker among those I have ever met."

This is the second award Teller has received from Hungary in the last four years. In 1990 he was awarded the Order of Banner with Rubies of the Republic of Hungary for his achievements in science and for "serving the universal welfare of humanity."

Marcel Grossmann Award

James Wilson, a physicist in his fifth decade at the Lab, received a prestigious Marcel Grossmann Award in July 1994, at the Seventh Marcel Grossmann Meeting on General Relativity, at Stanford University. The award honored Wilson "for having built on his experience in nuclear physics, thermonuclear reactions, and extensive numerical simulation to create a new testing ground for the novel concepts of relativistic astrophysics."



James Wilson
Marcel Grossmann Award

Marcel Grossmann (1878–1936) helped Einstein develop the mathematics of general relativity. This year marks the fourth distribution of the Grossmann Awards. Previous recipients include such notable physicists as Stephen Hawking and Nobel prize winner Abdus Salam. The other individual Grossmann Award in 1994 was given to Nobel laureate Subrahmanyan Chandrasekhar of the Enrico Fermi Institute, the University of Chicago. An institutional award was given to the Space Telescope Science Institute at Johns Hopkins University.

With a bachelor's degree in chemistry from UC Berkeley, Wilson went to Los Alamos, New Mexico, in 1943 to work on the Manhattan Project. Deciding that physics was his true calling, he earned a Ph.D. in physics in 1952 (also from UC Berkeley). He has been at LLNL since 1953, having begun in nuclear physics and weapons design but turning to astrophysics in the late 1960s. He addressed such fundamental areas as black holes, supernovas, gravitational waves, and relativity. As computer speeds accelerated over the years, Wilson increased the sophistication of the physics in his models, studying rotating magnetized supermassive stars, the accumulation of matter into black holes, and the role of hydrodynamic instability in astrophysical processes. These and other studies established Wilson as one of the world's pioneers in applying computational techniques to hard-to-measure natural events.

Some of Wilson's recent research has been an investigation of gravity radiation given off by colliding neutron stars. He hopes that observations from LIGO, the gravity wave detector now under construction at Hanford, Washington, and Livingston, Louisiana, will corroborate his numerical experiments. Wilson is also well known for his research on supernovas. He has also modeled heavy ion collisions, identifying the role played by subnuclear particles, called pions, in events involving matter packed into incredibly high densities, such as supernovas.

Wilson officially retired in 1988, but continues to work full time at the Laboratory. He is designing a supernova burst observatory to detect particles called tau neutrinos given off by supernova explosions in our galaxy. Wilson and collaborators are seeking funding to build this facility near Carlsbad, New Mexico.

Wilson is a fellow of the American Physical Society. He has been awarded visiting scientist positions at the University of Rome, Vatican Observatory, and Hebrew University.

Awards for Excellence in Technology Transfer

LLNL has aggressively pursued opportunities to sustain U.S. national security interests through technology transfer, the dissemination of Laboratory discoveries, and inventions into civil industrial and commercial applications to enhance U.S. economic competitiveness. In 1994 the Federal Laboratory Consortium gave Laboratory researchers four awards for excellence in technology transfer. These are more awards than were won by any of the other more than 650 government laboratories and research centers that make up the consortium. The consortium was formed in 1974 to help the public and private sectors exploit technologies developed by federal research laboratories. Awards were given to

- Precision engineer Dan Thompson, who has directed four Cooperative Research and Development Agreements (CRADAs) in machining and engineering with U.S. companies. Thompson has also directed the development of a series of machine-tool metrology workshops with the Society of Manufacturing Engineers.

In early 1992, Dan Thompson helped establish the Livermore Center for Advanced Manufacturing and Productivity, or LCAMP, which helps bridge the gap between the Lab's technological capabilities and the needs of U.S. manufacturing companies. To date, LCAMP has assisted in developing about 25 CRADAs at the Lab.

- Chemist Dan Makowiecki, who designed a new type of magnetron sputtering source that has been licensed to a California-based firm. (Sputtering is a vacuum coating process used to protect compact disks and integrated circuits.) The new magnetron sputtering source is a revolutionary, simple design that uses ceramics to remove process heat and

eliminate the problems associated with direct water cooling.

- Metallurgists Alfred Goldberg, Don Lesuer, Mike Strum, Stephen Root, Dick Landingham, and technician Paul Curtis, who have transferred a superplastic steel technology to two companies. Since late 1988, this team of Livermore scientists has been working with Stanford University, a steel company, and a heavy equipment manufacturer to move superplastic steel technology from initial research to production-scale demonstrations.

(Superplastic steel can flow like molasses under pressure and high temperature into complex shapes or dies, substantially reducing the need for welding, machining, and joining processes, which typically represent at least 25% of the cost of parts.)

- Mechanical engineers Robert Whirley and Bruce Engelmann, who helped transfer the computer program DYNA3D, used in analyzing impacts upon structures, to private industry. For the past several years, engineers Whirley and Engelmann have helped transfer the Lab's computer program to outside users; it is now used by some 750 companies, research laboratories, and universities. One of LLNL's most successful technology transfers ever, DYNA-like programs annually save U.S. industry \$350 million.

The R&D 100 Awards

Each year *R&D Magazine* selects the 100 most technologically significant products and processes submitted for consideration and honors them with an R&D 100 award. Winners are chosen by the editors of the magazine and a panel of 75 experts in a variety of disciplines. Corporations, government laboratories, private research institutes, and universities throughout the



Dan Thompson



Dan Makowiecki



Back row from left to right:

Paul Curtis, Alfred Goldberg, Don Lesuer, and Dick Landingham,

Front row from left to right:

Stephen Root and Mike Strum.

world vie for this “Oscar” of applied research. The R&D 100 judges look for products or processes that promise to change people’s lives, such as by significantly improving the environment, health care, or security. Since the competition began in 1963, the Laboratory has won over 55 R&D 100 awards.

In 1994, Laboratory researchers received six R&D 100 awards. Michael D. Perry, Robert D. Boyd, Jerald A. Britten, Derek E. Decker, Bruce W. Shore, and Howard T. Powell shared an award for developing multilayer dielectric gratings for use with high-power lasers. The far superior resistance of these gratings to optical damage compared to conventional metallic gratings allows the use of much greater effective laser intensities.

James J. DeYoreo, Natalia P. Zaitseva, Russell L. Vital, and Kenneth E. Montgomery received an award for developing a method of growing high-quality KDP crystals some 10 to 40 times more quickly than conventional methods, thus promising great savings in laser technology and all other fields requiring high-quality crystals.

Stephen A. Payne, Laura Deloach, Larry K. Smith, and William F. Krupke received their award for developing ytterbium-doped apatite laser crystals, which have 2.5 to 5 times the energy storage of other crystals and can therefore fully exploit the advantages of diode-pumped lasers.

David J. Hopkins received an award for developing a high-precision, low-noise amplifier that increases the resolution of sensors called linear variable differential transformers, used for measuring surface irregularities in precision engineering and manufacturing.

Michael D. Pocha, Oliver T. (Ted) Strand, and Daniel C. Nelson shared an award for developing a process and hardware for aligning single-mode opto-electronic fibers and components at submicron tolerances in very short times. The enormous potential savings in cost makes new communications standards economically possible for operation well above 1 Gb/s.

James D. Tucker received an award for developing DNA probes that color or “paint” chromosomes of the common laboratory mouse to

This page:
R&D 100 award winners.

From left to right:
Bruce W. Shore, Jerald A. Britten, Robert D. Boyd, and Michael D. Perry. Derek E. Decker and Howard T. Powell are not pictured.



From left to right:
William F. Krupke, Laura Deloach, Stephen A. Payne, and Larry K. Smith.



David J. Hopkins



James D. Tucker



From left to right:
Russell L. Vital, Natalia P. Zaitseva, Kenneth E. Montgomery, and James J. DeYoreo.



From left to right:
Oliver T. (Ted) Strand, Daniel C. Nelson, and Michael D. Pocha.

make them instantly identifiable, even by a novice investigator. Identifying chromosomes by the old method is difficult, even for someone highly trained. Painting is up to 200 times more efficient than banding, making it attractive for drug safety testing by pharmaceutical companies.

These awards signify that the Lab's work has been valuable not only for maintaining national security in the past, when defense research was necessarily the largest single component, but for advancing it now, when the mandates of economic competitiveness—speed, efficiency, and quality—give urgency to our work.

Intelligence Community Seal Medallion

A Laboratory research team, known as the Woodpecker Project, has been awarded the Intelligence Community Seal Medallion for its work on a classified project to improve information-gathering techniques. The award was presented at Central Intelligence Agency headquarters in Langley, Va., by the Deputy Director of the CIA and the Director of the National Security Agency.

The award cited the team's success "on a series of technical problems of enormous complexity, resulting in an extremely powerful operational capability that can be used to gather intelligence from unique sources not exploitable by any other means."

It went on to state that "many members of the Laboratory team, combining advanced concepts of physics and engineering, applied continuing determination to the solution of many practical problems that arose during this period. The Woodpecker Project team's brilliant insights and sustained efforts reflect credit upon themselves, the Lawrence Livermore National Laboratory, the National Security Agency, and the Intelligence Community."

The Seal Medallion is an intelligence community award bestowed upon groups or individuals that are not members of the intelligence community. The 21-member Woodpecker team started work on the project in 1985 with initial

feasibility studies. The team's final product was delivered to the project sponsor in 1992.

The Woodpecker team, part of the Nonproliferation/Arms Control/ International Security directorate, included individuals from the Laboratory's Mechanical Engineering, Electronics Engineering, and Chemistry and Materials Science departments.

Lab employee Frank Pabian received an individual Intelligence Community Award. Pabian was commended for his work in verification of South African denuclearization.

The Intelligence Community Award was established by the Director of the Central

Intelligence Agency to honor those who provide exceptional service on behalf of the U.S. Intelligence Community. It recognizes sustained superior performance of duty of high value that distinctly benefits the interests of the U.S. and is related to the mission of the Intelligence Community.



NASA Medals for Exceptional Achievement

Lyn Pleasance was awarded the NASA Medal for Exceptional Engineering Achievement for technical leadership of the Livermore team in the design, fabrication, and testing of the Clementine sensor suite. The team used advanced technologies to provide state-of-the art, wideband imaging and tracking capabilities with a lightweight instrument package.

Isabella T. Lewis received the NASA medal for Exceptional Scientific Achievement for her "skill and dedication in performing and adjusting the settings of the cameras and LIDAR system to obtain high-quality data of the moon."

Fellowships

Laboratory scientist Carl Henning has been elected a fellow of the American Nuclear Society. He has been associated with the society for more than a decade, has served as chairman of several



Frank Pabian
*Intelligence Community
Seal Medallion recipient*

conferences, and will chair the 1996 Topical Conference on Fusion Energy. Henning was elected a fellow, which is the society's highest membership grade, in recognition of the contributions he has made to the advancement of nuclear science and technology through the years, according to a letter from society President Alan Waltar.

He has recently served in Washington, D.C., as coordinator of the National Ignition Facility (NIF) for Defense Programs, coordinating the work on Key Decision One between the Department of Energy's Defense Programs, the Laboratory, and DOE's Oakland office, and serving as conceptual design review deputy manager for NIF.

Henning started at the Laboratory in 1965, leaving in 1973 to serve as vice president of Intermagnetics General and later as branch chief of the DOE, and returned to the Lab in 1978. He served as deputy project manager for the Mirror Fusion Test Facility from 1978 to 1981, headed the Lab's Mirror Fusion Program Office from 1982 to 1986, served as U.S. deputy managing director for the International Thermonuclear Experimental Reactor from 1987 to 1990, and was deputy program leader in charge of Laser Science and Technology from 1990 to 1993.

Don Correll has been elected a fellow of the American Physical Society (APS). Correll, Deputy Program Leader for Laser Fusion, was recognized for his contributions to science education.

The APS awarded Correll a fellowship "for being actively involved in science education with public audiences, pre-college and college students, and teachers, as well as an effective and committed spokesman for science education." Correll has been a lecturer at UC Davis/Livermore, has been involved in science education with a wide range of audiences, has co-authored fusion instructional material for high school science teachers, and is an advisor on fusion energy to the Chicago Museum of Science and Industry. Although several Lab scientists have been elected fellows to the APS over the past few years, Correll is believed to be the first to be so honored for educational achievements, a newly identified Laboratory priority. "Because scientists through their research activities are continuously teaching themselves and their colleagues, physicists are ideally suited for not only teaching recently acquired knowledge, but for helping teachers and students learn to teach themselves," said Correll. "I believe it is the professional responsibility of physicists—indeed all Lab scientists and engineers—to pass along their knowledge."

Dennis Hewett, a plasma physicist in the Laser Program, has been elected a fellow of the American Physical Society. He was honored for his work in plasma simulation and modeling. Hewett's fellowship certificate reads: "For significant contributions to the formulation of implicit plasma simulation methods, to the solution of linear systems, and for many advances



Carl Henning
*Fellow of the
American Nuclear Society*



Don Correll
*Fellow of the
American Physical Society*



Dennis Hewett
*Fellow of the
American Physical Society*

in successfully modeling experiments.” Hewett uses computational tools that he has developed in order to design sophisticated low-emittance ion sources for heavy ion fusion accelerators.

Jay C. Davis, recently named Acting Associate Director for Environmental Programs, has been elected a Fellow of the American Physical Society. The honor comes in recognition of his contributions in a number of physics disciplines. Davis’s Fellowship Certificate reads: “For his substantial contributions to fields varying from nuclear physics, fusion, material science, arms control, and biomedical dosimetry through creative and original design of accelerator and research facilities.”

Davis joined the Lab in 1971 and in 1988 was appointed director of the Center for Accelerator Mass Spectrometry. The multidisciplinary, multi-organizational group applies accelerator analytical techniques to problems in biomedicine, geochemistry, materials science, and arms control. In 1993 Davis became program leader for Geoscience and Environmental Research at LLNL, overseeing the Lab’s efforts in studying global climate change, environmental sciences, earth sciences, and the emergency response to airborne release of toxic radioactive materials. Davis was one of several Lab scientists who participated in the inspections of suspected Iraqi nuclear facilities after the Gulf War.

Steve Haan, a physicist in X Division, was recently named a Fellow of the American Physical

Society. Haan, who has been a member of APS for his entire career, was awarded his fellowship “for pioneering work in the theory and modeling of hydrodynamic instabilities and mix in Inertial Confinement Fusion (ICF) targets and for leadership in the design and analysis of ignition and gain in ICF targets.” Haan studies the ripples, or perturbations, on the surface of imploding inertial confinement fusion fuel targets. Much of Haan’s modeling work has been tested on the Nova laser and will have a major impact on the National Ignition Facility.

Marvin Ross, a division leader for condensed matter physics at the Laboratory until 1993 and now a senior scientist emeritus, has been elected a Fellow of the American Physical Society. The honor comes in recognition of Ross’s accomplishments in the area of high-pressure physics. Ross received his fellowship “in recognition of important and broad ranging scientific advancements toward understanding of the behavior of matter at high pressures, and for his leadership role in the field of high pressure physics.” Ross joined the Lab in 1963 as a research scientist in the Physics Department before assuming division leadership in 1987. In the Condensed Matter Division, about 30 Ph.D. physicists carry out a broad research program in theoretical physics, equations of state, materials physics, shockwave, and diamond anvil research.



Jay Davis
*Fellow of the
American Physical Society*



Steve Haan
*Fellow of the
American Physical Society*



Marvin Ross
*Fellow of the
American Physical Society*